

U.S. Appl. No. 09/835,515
Attorney Docket No. 2916-0133P
Page 2 of 16

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listing, of claims in the application:

1. (Currently Amended) The data broadcast system of claim 44, For use with a broadcast system operable to carry digital packets to multiple recipients simultaneously, wherein the content liaison unit includes comprising:

a content provider (CP) interface to receive, from the at least one content provider unit, a specification of the digital content that is to be inserted into said the broadcast system signal and an insertion schedule by which said the digital content is to be inserted into said the broadcast system signal, wherein said digital content pertains to data broadcasting;

a collection unit, responsive to said the CP interface, to collect digital files of said the digital content by at least one of actively retrieving and reactively receiving said the digital files from a source thereof identified in said the specification; and

an insertion unit, responsive to said the CP interface, to transfer said the digital files from said the collection unit to said the broadcast system according to said the insertion schedule.

2. (Currently Amended) The liaison unit data broadcasting system of claim 1, wherein said the collection unit includes memory into which said the collection unit is operable configured to store said the digital files so as to decouple, in time, the collection and the transfer of said the digital files.

3. (Currently Amended) The liaison unit data broadcasting system of claim 1, wherein:

said the content provider unit is a first content provider unit, said the specification is a first specification and said the insertion schedule is a first insertion schedule;

said the CP interface also is operable configured to receive, from a second content provider unit, a second specification of second digital content that is to be inserted into said the broadcast system signal and a second insertion schedule by which said the second digital content is to be inserted into said the broadcast system signal;

U.S. Appl. No. 09/835,515
Attorney Docket No. 2916-0133P
Page 3 of 16

~~saidthe~~ collection unit also is ~~operable-configured~~ to collect ~~saidthe~~ second digital content by at least one of actively retrieving and reactively receiving ~~saidthe~~ second digital content from a source thereof identified in ~~saidthe~~ second specification;

~~saidthe~~ insertion unit also being ~~operable-configured~~ to transfer ~~saidthe~~ second digital content from ~~saidthe~~ collection unit to ~~said~~a mixing unit according to ~~saidthe~~ second insertion schedule.

4. (Currently Amended) The ~~liaison-unit~~data broadcasting system of claim 3, wherein ~~saidthe~~ first specification, ~~saidthe~~ first insertion schedule, ~~saidthe~~ second specification and ~~saidthe~~ second insertion schedule are provided to ~~saidthe~~ CP interface using a common communications protocol.

5. (Currently Amended) The ~~liaison-unit~~data broadcasting system of claim 1, wherein ~~saidthe~~ specification includes at least one of the following:

a characterization of the type of ~~saidthe~~ digital content;

a resource locator to define a location where ~~saidthe~~ digital content can be obtained by ~~saidthe content~~ liaison unit;

a transfer schedule by which ~~saidthe content~~ liaison unit is to obtain ~~saidthe~~ digital content;

an indication of whether ~~saidthe content~~ liaison unit will actively retrieve or responsively receive ~~saidthe~~ digital content from a source of ~~saidthe~~ digital content;

an indication of whether ~~saidthe~~ digital content is to be compressed by ~~saidthe corresponding content provider unit~~ or by ~~the saidcontent~~ liaison unit;

an indication of whether ~~saidthe~~ digital content is to be encrypted by ~~saidthe corresponding content provider unit~~ or by ~~saidthe content~~ liaison unit; and

an indication of whether ~~saidthe~~ digital content is to undergo forward error correction transformations by ~~saidthe corresponding content provider unit~~ or by ~~the saidcontent~~ liaison unit.

6. (Currently Amended) The ~~liaison-unit~~data broadcasting system of claim 5, wherein ~~saidthe~~ transfer schedule includes a first set of at least one time for ~~saidthe~~ digital

U.S. Appln. No. 09/835,515
Attorney Docket No. 2916-0133P
Page 4 of 16

content to be collected and a second set of at least one time for saidthe digital content to be transferred, saidthe second set being different than saidthe first set.

7. (Currently Amended) The ~~liaison-unit~~data broadcasting system of claim 1, wherein saidthe content liaison unit is sufficiently robust to interpret a valid insertion schedule whenever saidthe insertion schedule is defined in terms of each of the following scheduling parameters taken alone or in combination:

a start time of a time slot during which an item can be output from saidthe content liaison unit to saidthe broadcast system;

an end time for saidthe time slot;

a duration (D) of saidthe time slot;

a time interval (INT) between successive outputs of saidthe item from saidthe content liaison unit to saidthe broadcast system during saidthe time slot;

a number (N) of times that saidthe item is to be output from saidthe content liaison unit to saidthe broadcast system during a time slot;

a size (S) of saidthe item; and

a bitrate (BTR) at which saidthe item is to be output from thesaid content liaison unit to saidthe broadcast system.

8. (Currently Amended) The ~~liaison-unit~~data broadcasting system of claim 7, wherein saidthe insertion schedule is a microschedule;

wherein saidthe CP interface is operable to receive a macroschedule including at least one recurring time slot, each recurring slot having a microschedule, respectively; and

wherein saidthe insertion unit is responsive to saidthe macroschedule.

9. (Currently Amended) The ~~liaison-unit~~data broadcasting system of claim 7, wherein, if two or more of saidthe scheduling parameters are contradictory, then the contentsaid liaison unit is operable to apply at least one conflict resolution rule to ignore at least one of the contradictory scheduling parameters in order to interpret saidthe insertion schedule to be valid.

U.S. Appln. No. 09/835,515
 Attorney Docket No. 2916-0133P
 Page 5 of 16

10. (Currently Amended) The ~~liaison-unit~~data broadcasting system of claim 9, wherein ~~said~~the at least one conflict resolution rule includes at least one of the rules from the following Rule Table:

Rule Table

Parameters Specified				Rule
INT	BTR	D	N	
Y	Y	Y	Y	If $INT < S/BTR$, set $INT = S/BTR$ Ignore N, Output at INT using BTR, for D (timed),
Y	Y	Y	N	If $INT < S/BTR$, set $INT = S/BTR$ Output at INT using BTR, for D (timed),
Y	Y	N	Y	If $INT < S/BTR$, set $INT = S/BTR$ Output at INT using BTR, N times (timed),
Y	Y	N	N	If $INT < S/BTR$, set $INT = S/BTR$ Output at INT using BTR, indefinitely (timed),
Y	N	Y	Y	Set $BTR = \text{account BTR}$, If $INT < S/BTR$, set $INT = S/BTR$ Ignore N, Output at INT using BTR, for D (timed),
Y	N	Y	N	Set $BTR = \text{account BTR}$, If $INT < S/BTR$, set $INT = S/BTR$ Output at INT using BTR, for D (timed),
Y	N	N	Y	Set $BTR = \text{account BTR}$, If $INT < S/BTR$, set $INT = S/BTR$ Output at INT using BTR, N times (timed),
Y	N	N	N	Set $BTR = \text{account BTR}$, If $INT < S/BTR$, set $INT = S/BTR$ Output at INT using BTR, indefinitely (timed),
N	Y	Y	Y	Set $INT = D/N$, If $INT < S/BTR$, set $INT = S/BTR$ Output at INT using BTR, for D (timed),
N	Y	Y	N	Set $INT = S/BTR$, Output at INT using BTR, for D (timed),
N	Y	N	Y	Set $INT = S/BTR$, Output at INT using BTR, N times (timed),
N	Y	N	N	Set $INT = S/BTR$, Output at INT using BTR, indefinitely (timed),

U.S. Appln. No. 09/835,515
 Attorney Docket No. 2916-0133P
 Page 6 of 16

Parameters Specified				Rule
INT	BTR	D	N	
N	N	Y	Y	Set BTR = account BTR, Set INT = D/N, If INT < S/BTR, set INT = S/BTR Output at INT using BTR, for D,
N	N	Y	N	Output for D (non-timed),
N	N	N	Y	Output N times (non-timed),
N	N	N	N	Output indefinitely (non-timed).

11. (Currently Amended) The ~~liaison-unit-data broadcasting system~~ of claim 1, wherein ~~said~~the CP interface receives ~~said~~the specification and ~~said~~the insertion schedule represented as at least one XML document from ~~the correspondingsaid~~ content provider unit.

12. (Currently Amended) The ~~liaison-unitdata broadcasting~~ of claim 1, wherein ~~said~~the specification includes an account, each account including at least one catalog, each catalog including at least one independent item to be output by ~~said~~the content liaison unit to ~~said~~the broadcast system or at least one group of related items to be output by ~~said~~the content liaison unit to ~~said~~the broadcast system, each group including a group of related items or an independent item.

13. (Cancelled)

14. (Currently Amended) The ~~liaison-unitdata broadcasting system~~ of claim 1, wherein:
~~said~~the specification and insertion schedule are associated with an account; and
~~said~~the insertion unit is operable to limit an insertion-schedule-dictated transference of ~~said~~the digital content so as to comply with a bandwidth allocation for ~~said~~the account.

15. (Currently Amended) The ~~liaison-unitdata broadcasting system~~ of claim 14,

U.S. Appln. No. 09/835,515
Attorney Docket No. 2916-0133P
Page 7 of 16

wherein ~~said~~the insertion unit limits ~~said~~the transference by processing ~~said~~the insertion schedule as a plurality of incremental time slices, ~~said~~the bandwidth allocation representing a maximum data amount of data that can be transferred in each time slice, respectively; and

wherein, if transference of ~~said~~the maximum amount of data takes place before the end of a time slice, then ~~said~~the insertion unit is operable to suspend the transference until a next time slice begins.

16. (Currently Amended) ~~For use with a~~The data broadcast system of claim 44,
~~system operable to carry digital packets to multiple recipients simultaneously, a~~ wherein each of
~~the at least one~~ content provider unit ~~includes comprising:~~

an insertion schedule generator to generate a specification of the digital content to be inserted into ~~said~~the broadcast signalsystem and an insertion schedule by which ~~said~~the digital content is to be inserted, ~~wherein said digital content pertains to data broadcasting; and~~

an interface to a liaison unit to provide, in a machine-readable form, ~~said~~the specification of ~~said~~the digital content that is to be inserted into ~~said~~the broadcast signalsystem and ~~said~~the insertion schedule by which ~~said~~the digital content is to be inserted into ~~said~~the broadcast signalsystem.

17. (Currently Amended) ~~The data broadcasting system~~ content provider unit of claim 16, further comprising a source of ~~said~~the digital content.

18. (Currently Amended) ~~The data broadcasting system~~ content provider unit of claim 16, wherein

~~said~~the broadcast system is a first broadcast system, ~~said~~the machine-readable form is a first machine-readable form, ~~said~~the specification is a first specification, and ~~said~~the insertion schedule is a first insertion schedule; and

~~said~~the corresponding content provider unit is ~~operable configured~~ to provide to a second broadcast system, in a second machine-readable form, a second specification of second digital content that is to be inserted into ~~said~~the broadcast signalsystem and a second insertion schedule by which ~~said~~the second digital content is to be inserted into ~~said~~the broadcast systemsignal.

U.S. Appln. No. 09/835,515
Attorney Docket No. 2916-0133P
Page 8 of 16

19. (Currently Amended) The ~~data broadcasting system~~content provider unit of claim 18, wherein each of ~~said the~~ first machine-readable form and ~~said the~~ second machine-readable form is compliant with a common protocol.

20. (Currently Amended) The ~~content provider~~data broadcasting system of claim 16, wherein ~~said the~~ specification includes at least one of the following:

- a characterization of the type of ~~said the~~ digital content;
- a resource locator to define a location where ~~said the~~ digital content can be obtained by a broadcaster unit;
- a transfer schedule by which ~~said the~~ broadcaster unit is to obtain ~~said the~~ digital content;
- an indication of whether ~~said the~~ broadcaster unit will actively retrieve or responsively receive ~~said the~~ digital content from a source of ~~said the~~ digital content;
- an indication of whether ~~said the~~ digital content is to be compressed by a content provider or by ~~said the~~ liaison unit;
- an indication of whether ~~said the~~ digital content is to be encrypted by ~~said the~~ corresponding content provider unit or by ~~said the~~ content liaison unit; and
- an indication of whether ~~said the~~ digital content is to undergo forward error correction transformations by ~~said the~~ corresponding content provider unit or by ~~said the~~ content liaison unit.

21. (Cancelled)

22. (Currently Amended) The ~~content provider unit~~data broadcasting system of claim 16, wherein ~~said the~~ machine-readable form is a first machine-readable form, and ~~said the~~ specification is a first specification and ~~said the~~ insertion schedule is a first insertion schedule, ~~said the~~ first specification and ~~said the~~ first insertion schedule corresponding to a first account maintained by ~~said the~~ corresponding digital content provider unit, ~~said the~~ first account being bounded by a first bandwidth allocation; and

~~said the~~ corresponding content provider unit is ~~operable~~configured to provide, to ~~said the~~ broadcast system in a second machine-readable form, a second specification of second digital

U.S. Appl. No. 09/835,515
Attorney Docket No. 2916-0133P
Page 9 of 16

content that is to be inserted into ~~said~~the broadcast system-signal and a second insertion schedule by which ~~said~~the second digital content is to be inserted into ~~said~~the broadcast system-signal, ~~said~~the second specification and ~~said~~the second insertion schedule corresponding to a second account maintained by ~~said~~the corresponding content provider unit, ~~said~~the second account being bounded by a second bandwidth allocation different than ~~said~~the first bandwidth allocation.

23. (Currently Amended) The ~~content provider unit~~data broadcasting system of claim 16, wherein ~~said~~the insertion schedule generator is sufficiently robust to generate a valid insertion schedule in terms of each of the following scheduling parameters taken alone or in combination:

a start time of a time slot during which an item can be output from ~~said~~the content liaison unit to ~~said~~the broadcast system;

an end time for ~~said~~the time slot;

a duration of ~~said~~the time slot;

a time interval between successive outputs of ~~said~~the item from ~~said~~the content liaison unit to ~~said~~the broadcast system during ~~said~~the time slot;

a number of times that ~~said~~the item is to be output from ~~said~~the content liaison unit to ~~said~~the broadcast system during a time slot;

a size of ~~said~~the item; and

a bitrate at which ~~said~~the item is to be output from ~~said~~the content liaison unit to ~~said~~the broadcast system.

24. (Currently Amended) The ~~content provider unit~~data broadcasting system of claim 23, wherein ~~said~~the insertion schedule is a microschedule, and

wherein ~~said~~the insertion schedule generator is ~~operable~~configured to provide a macroschedule including at least one recurring time slot, each recurring slot having a microschedule, respectively.

U.S. Appln. No. 09/835,515
Attorney Docket No. 2916-0133P
Page 10 of 16

25. (Currently Amended) The ~~content provider unit~~ data broadcasting system of claim 16, wherein ~~said the~~ machine readable form includes representation of ~~said the~~ specification and ~~said the~~ insertion schedule as at least one XML document.

26. (Currently Amended) The ~~content provider unit~~ data broadcasting system of claim 16, wherein ~~said the~~ specification includes an account,

each account including at least one catalog, each catalog including at least one independent item to be output by ~~said the~~ content liaison unit to ~~said the~~ broadcast system or at least one group of related items to be output by ~~said the~~ content liaison unit to ~~said the~~ broadcast system, each group including a group of related items or an independent item.

27 – 34. (Cancelled)

35. (Previously Presented) A method as embodied in elements which form the content liaison unit of claim 1.

36. (Previously Presented) A computer-readable medium having embodied thereon at least one program to cause at least one processor to implement the content liaison unit of claim 1.

37. (Previously Presented) A method as embodied in elements which form the content provider unit of claim 16.

38. (Previously Presented) A computer-readable medium having embodied thereon at least one program to cause at least one processor to implement the content provider unit of claim 16.

39 – 43. (Cancelled)

U.S. Appl. No. 09/835,515
Attorney Docket No. 2916-0133P
Page 11 of 16

44. (Currently Amended) A data broadcast system for use with a broadcast system operable to carry digital packets to multiple recipients simultaneously, the data broadcast system comprising:

at least one content provider unit to generate a specifications of digital content and an insertion instructionschedule for inserting by which the digital content is to be inserted into a broadcast signal, wherein the digital content pertains to data broadcasting; and

a content liaison unit to allocate a bandwidth profile to each of the at least one content provider unit, communicate with the content provider unit over a communications network, to receive the specifications of digital content and the insertion instructionschedule from the each of the at least one content provider unit over the communications network, and to insert the digital content into the broadcast signal according to the insertion instructions based on the bandwidth profile allocated to each of the at least one content provider unitschedule,

wherein the bandwidth profiles are communicated from the content liaison unit to the at least one content provider unit over a communication network, and the specifications of digital content and the insertion instructions are communicated from the at least one content provider unit to the content liaison unit over the communication network, and

wherein the insertion instructions generated by each content provider unit completely determines a time at which each digital content item referenced in the corresponding specifications of digital content is inserted into the broadcast signal, independently of the insertion instructions generated by any other content provider unit.

45. (Previously Presented) The data broadcast system of claim 44, wherein the broadcast signal into which the digital content is inserted contains therein video and/or audio program content.

46. (Currently Amended) The data broadcast system of claim 44, wherein prior to the allocation, the at least one content provider unit and the content liaison unit negotiate with each other over the communications network regarding the allocation of the bandwidth profilesto allocate a bandwidth for the digital content specified by the content provider unit.

U.S. Appln. No. 09/835,515
Attorney Docket No. 2916-0133P
Page 12 of 16

47. (Previously Presented) The data broadcast system of claim 44, further comprising:
at least one receiver device to receive the broadcast signal including the digital content
and to extract data from the received broadcast signal.

48-50. (Cancelled)

51. (New) The data broadcast system of claim 1, wherein the content liaison unit further
includes a bandwidth management unit configured to allocate the bandwidth profile to each of
the at least one content provider unit.